

## A. CURRENT SITUATION

### 1. Management Direction

Current direction for road management is found in the 1990 Land and Resource Management Plan (LRMP) for the Gifford Pinchot National Forest that states, “ Plan design, operate, and maintain a safe and economical transportation system providing efficient access for the movement of people and materials involved in the use and protection of National Forest Lands.” Furthermore, the plan states, “Manage roads to reduce maintenance costs, protect soil and water resources, avoid wildlife harassment, and provide quality hunting and dispersed recreation opportunities.” Detailed road management direction is contained in each management area set of standards and guidelines.

The 1994 Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (ROD, Northwest Forest Plan) amended the 1990 LRMP for the Gifford Pinchot N.F. This document includes direction to decommission roads in Key Watersheds and restore watersheds in part through management of the road system with a variety of possible treatments including closing and stabilizing roads, upgrading roads by modifying road drainage systems to reduce the extent to which the road functions as an extension of the stream network, and reconstructing stream crossings to reduce the risk and consequences of road failure or washing out at the crossings. Specific direction includes: “Road construction in Late-Successional Reserves... generally is not recommended...” (ROD, page C-16) In Riparian Reserves, “... Meet Aquatic Conservation Strategy objectives by: ...reconstructing roads and associated drainage features that pose a substantial risk, ...prioritizing reconstruction based on current and potential impact to riparian resources, and...closing and stabilizing, or obliterating and stabilizing roads...” (ROD page C-32 and C-33)

On January 12, 2001, the U.S. Department of Agriculture, Forest Service, developed manual direction (FSM 7700) to address both the access benefits and ecological costs of road-associated effects, give priority to reconstructing and maintaining needed roads and decommissioning unneeded roads, or, where appropriate, converting them to less costly and more environmentally beneficial other uses. Responsible officials are directed to use a Roads Analysis process to ensure that road management decisions are based on identification and consideration of social and ecological effects. Roads Analysis: Informing Decisions About Managing the National Forest Transportation System (FS-643) has been provided as guidance for conducting a science based roads analysis. The objective is to manage forest transportation system facilities to provide user safety, convenience, and efficiency of operations in an environmentally responsible manner and to achieve road related ecosystem restoration with the limits of current and likely funding levels.

In 2001, the Gifford Pinchot National forest signed a Memorandum of Agreement with the Washington State Department of Ecology relating to compliance with the Clean Water Act. The agreement specifies a road assessment to be completed that focuses on aquatic risks and fish passage. The recommendations from this roads analysis are expected to meet the standards required by the Clean Water Act and those specified in the agreement.

## 2. Road History and Statistics

Indian trails on the Forest were frequently the routes used by early road builders after the turn of the century. Built primarily for administrative purposes and fire control, this system expanded materially in the 1930's as a result of work by the Civilian Conservation Corps. Many state and county routes access the Forest were paved during this period. From the 1940's to date, road construction, reconstruction and improvements have primarily been associated with timber management. At the present time, there are approximately 4,072 miles of Forest Service classified roads in the Gifford Pinchot National Forest transportation system. Of these, approximately 830 miles are opened and maintained for all vehicles and another 2,715 miles require high-clearance vehicles. The remaining 527 miles are closed to all traffic.

### Road Management Strategies

To describe the various types of road management strategies, the 1994 Gifford Pinchot National Forest Access and Travel Management Plan (ATM Plan) uses the following codes and descriptions for road management:

#### *Maintained for Passenger Cars: (OP)*

This is a type of "open" road that is maintained for passenger cars use, and open all year long, except when closed by weather conditions.

#### *Maintained for High-Clearance Vehicles: (OH)*

This is a type of "open" road that is maintained for high clearance vehicles, an open all year long, except when closed by weather conditions. Passenger cars are allowed to use these roads, at driver discretion.

#### *Seasonally Open: (SO)*

These roads are closed part of the year to the public with a gate, sign or other device, for purposes of wildlife management, recreation usage or other resource management reasons. Most of these roads are maintained for high-clearance vehicle use, and some are maintained for passenger car use.

#### *Closing Naturally: (CN)*

These roads serve no identified access need, and are not causing resource damage. Therefore, they do not need to be closed immediately with a closure device. Closure will occur gradually. We will not cut brush or remove slumps or rock fall unless resource damage is occurring. The lack of maintenance will eventually result in the road becoming impassable to motor vehicles. The road may have a closure device, depending on road condition.

*Closed With Device (CD)*

These roads are closed to the public year-round, but will remain on the road system for potential use in the future. In those cases where the Access and Travel Management Plans have identified an administrative traffic need, such as fire control, special use access, etc...the road will still be maintained for this specialized traffic, and closed with a gate or other removable device. In those cases where the Access and Travel Management Plans have not identified an administrative traffic need, closure devices, natural barricades, or removal of culverts controls access. In some instances the road may be scarified and seeded or planted.

*Decommission: (DE)*

These roads are permanently removed from the road system. Unstable fills are removed and drainage problems have been corrected. Generally, roads that are having impacts on watershed quality or other resources, and are not needed for public or administrative access, are identified as candidates for decommissioning.

*Roads To Trails: (RT)*

These roads are permanently removed from the road system and added to the Forest trail system, unstable fills are removed and drainage problems have been corrected and a trail developed along the former roadbed.

The following table summarizes the current situation for each of these road management strategies on the Forest:

<b>Road Management</b>	<b>Miles</b>
OP	653
OH	1,659
SO	478
CN	355
CD	972
RT	22
DE	319

**Road Maintenance**

Road maintenance is divided into the following five categories:

*Level 1 – Closed to all traffic*

*Level 2 – Open and maintained for high-clearance vehicles*

*Level 3 – Open and maintained for passenger cars; low level of comfort*

*Level 4 - Open and maintained for passenger cars; moderate level of comfort*

*Level 5 - Open and maintained for passenger cars; high level of comfort*

Levels 3 through 5 are considered highways, and are subject to regulations of the National Traffic Standards Safety Act. These standards require signing, brushing to maintain sight distance, and other maintenance required for user safety.

The following table summarizes the current situation for each of the road maintenance levels on the Forest:

<b>Maintenance Level</b>	<b>Miles</b>
Level 1	671
Level 2	2,624
Level 3	518
Level 4	190
Level 5	113

### **3. Existing uses**

The current road uses in the Gifford Pinchot National Forest fall under four general categories:

Commercial - Usually non-Forest Service employees conducting commerce activities, such as delivering goods and services in, adjacent to, or out of the National Forest.

Recreation – Typically people who use Forest Service roads to access and use trails, campsites, interpretive sites, heritage sites, waterways, dams, etc.

Administrative - Forest Service or other agency employees acting in official capacity conducting day-to-day work activities.

Public/Private – Public access within the Forest occurs on numerous roads administered by counties or the State. Private roads or roads having easements that allow shared use or exclusive private use generally occur within privately owned parcels of land within the boundaries of the Forest.

*Commercial*

A dramatic reduction in the National Forest timber harvest program created by the change in land allocations associated with the Northwest Forest Plan has reduced the need for timber-associated traffic, however other commercial uses of forest resources exist in the gathering of special forest products. These products include but are not limited to firewood, herbs, mushrooms, various plants used in floral arrangements, Christmas trees and boughs, and transplants of shrubs and small trees.

*Recreation*

Recreation use of roads includes numerous activities. For some of these activities, roads provide access to a particular recreation site, such as a trailhead, campground, sno-park, hunting or fishing sites, or dispersed use sites or areas. Other recreation uses of roads are more directly related to the road itself, such as driving for pleasure or sightseeing, or off-road vehicle (ORV) or four-wheel drive vehicle travel on primitive roads.

Additional recreation use of roads occurs with activities that are not necessarily considered recreation, depending on the circumstances or the individual. These include such activities as firewood cutting, mushroom gathering, berry picking, or other forms of forest product collection.

*Administrative*

Administrative access is that which is necessary for the administration of Forest lands. This can include access related to fire suppression or detection; access to administrative sites such as Ranger Stations, weather stations and lookouts; or access for contracts that result in the use or removal of forest resources such as timber, rock or special forest products.

*Public/Private*

This type of access is usually related to public roads that traverse the Forest or access to private land parcels within or adjacent to the Forest. In some cases regarding private land access, the landowner has exclusive use of the road, in other cases the use is shared between the landowner and the Forest Service and sometimes, additional parties, by a formal agreement describing each party's rights and responsibilities.

## **B. ISSUES AND OTHER FACTORS USED IN THE ANALYSIS**

Issues regarding management of the Forest road system were divided into three major categories: Access Needs, Aquatic Risks, and Terrestrial Risks. A couple of the issues did not fit neatly into a category but for simplicity these issues were placed in the category that seemed to fit the best. For each issue there is a section describing the issue, an objective for road management related to the issue, analytical questions to be answered, and criteria to be used to evaluate the issue for each road segment.

### **1. Access Needs**

#### **a. Private Lands Access and Other Easements**

*Identification:* The Forest's current transportation system includes many roads that are located on and also provide access to privately owned lands. Forest Service-managed roads located on private lands are in place through Government acquisition of easement rights. The Government may have obtained such easements subject to rights of subsequent road use by an owner of underlying lands, or even to existing third party rights of use. The Government may also have subsequently granted easement rights along its easements to other parties, very recently including associations of residential property owners.

In areas of mixed land ownership, a Forest Service-managed road may provide access to numerous scattered parcels of land belonging to a single private landowner or to multiple private owners. Forest roads, and even road systems, in such areas may be "cost-shared"; i.e. both Government and a private landowning cooperator share ownership in road facilities. Within some cost-share agreement areas, the Government may have granted easements across National Forest lands for non-shared cooperator-owned and managed roads that access cooperator lands.

An easement, whether cost-share or non-cost-share, is a partial interest in real estate. It is governed by the terms of a recorded deed. Terms of an easement deed remain fixed, unless modified by mutual grantor/grantee agreement. Easements granted by the Government are not "permits" that may simply be revoked for the Government's current convenience. They may, in fact, have originally been granted in return for easements needed by the Government.

The Forest's current right-of-way atlas indicates that in the last 75 years, the Government has both granted and acquired road easements in approximately seventy townships located within and adjacent to the Forest boundary.

*Objective:* Recognize existing road easement rights when evaluating proposals to close roads located within or adjacent to Forest lands.

*Analytical Questions:*

1. What types of easement rights may be at issue?

2. Are the easement rights still needed, and if not, how easily could such rights be terminated, or modified, by mutual agreement between grantor and grantee?
3. Could, or should, Government easement rights ultimately be conveyed to a public road agency, such as a County?

*Evaluation Criteria:*

Yes or no to the above analytical questions.

**b. Mining and Special Use Permit Access**

*Identification:* Mineral resources may be extracted from Gifford Pinchot National Forest lands under provisions of Federal mining laws. Mining operations authorized by a Notice of Intent or Plan of Operations occur on a relatively small percentage of several hundred locatable minerals claims, which exist on the Forest. Although there are no active leases for energy resources (petroleum, natural gas, geothermal steam), there are a number of outstanding lease applications. The forest provides a number of sources for common variety mineral materials (rock, sand, and gravel), which are sold, to both commercial users and private individuals. Road access is needed to facilitate most of these mineral extraction activities.

Over 300 permits have been authorized for a wide range of special uses on the Forest. In most cases, holders of special use permits require road access to engage in the authorized uses.

*Objective:* Retain existing road access to locatable mineral extraction sites covered by an approved notice of intent or plan of operations, community rock pits and quarry sites for which permits are issued, and sites at which special uses have been authorized.

*Analytical Questions:*

1. Does the road provide primary or the only access to mining claims with approved plans of operations or notices of intent?
2. Does the road provide primary or the only access to a developed or undeveloped quarry site?
3. Does the road provide primary or the only access a closed, depleted, or terminated quarry site?
4. Does the road provide primary or the only access a site or sites at which special uses have been authorized?

*Evaluation Criteria:* Yes or no to the above analytical questions.

**c. Access to Administrative Sites**

*Identification:* The Forest Service has established a network of developments used for administration of the Forest, including fire lookouts, guard stations, communications sites, seed orchards, air quality monitoring sites, and other similar facilities. Most of these sites require road access.

*Objective:* Retain road access to administrative sites or facilities.

*Analytical Question:*

Does the road provide access to administrative sites?

*Evaluation Criteria:* Yes or no to the above analytical question.

#### **d. Fire Detection and Suppression**

*Identification:* The majority of wildfires on the Gifford Pinchot National Forest is caused by lightning and are less than ten acres in size when contained. The number of human caused fire ignitions has and will continue to increase as more individual's visit and urban development continues around the forest. Catastrophic fires, while less frequent, have and will continue to occur due to the fuel loading, topography and weather conditions of the Pacific Northwest.

Open roads on the Forest increase the ability of responding to wildfire ignitions in a timely manner utilizing fire engines, water tenders, and crews. Access to water for pumps, engines, and tenders also minimize time needed in re supplying this equipment for fire suppression. Roads also can be used as control lines and safety areas depending upon fire behavior and are important in the development of strategy and tactics for fire suppression. Access to ridge tops and "vantage points" allow for lookouts and vistas during fire detection and suppression. Open roads on the forest also increase the risk of human caused fire by allowing vehicle access into more remote locations as visitation increases.

*Objective:* Identify road access to sites and areas important for the detection or suppression of wildfires.

*Analytical Questions:*

1. Does the road access existing structures or projected future sites requiring rural fire protection?
2. Does the road access other agency or private timberlands that have fire protection responsibilities?
3. Does the road access a water site that is in an area of limited sources?
4. Does the road access lookouts, vantage points, radio repeaters, weather stations, or trails utilized by fire management?
5. Does the road provide access to a topographical firebreak, or the only access to a large geographical area?



6. Does the road access areas where existing and planned fuels management work will be completed /needed?

*Evaluation Criteria:* Yes or no to the above analytical questions.

#### **e. Recreational Uses – Developed Sites and Dispersed Areas**

*Identification:* Access to recreation sites and areas is a critical component in providing a quality recreation experience for forest visitors.

The Gifford Pinchot National Forest provides over 200 developed recreation facilities, including visitor centers, scenic overlooks, interpretive sites, information stations, campgrounds, picnic areas, boat ramps, snow parks, and major trailheads. These are sites at which the Forest Service has enhanced opportunities for public recreation through the development of facilities designed for the convenience of recreational users.

Road-oriented recreation use also occurs on many other parts of the Forest. Users concentrate in some areas that provide the setting and recreational opportunities they seek. Most of these concentrated use areas (CUAs) have no formal recreational developments, although the Forest Service has provided limited facilities at some sites to maintain sanitary conditions and protect the environment. A concentrated use area may be a small cluster of informal campsites, an informal day use swimming area, or a large complex campsites extending for a mile or more along a Forest road. Although relatively undeveloped, CUAs require a Forest Service investment of time and money to provide periodic litter pickup, patrol, and monitoring of environmental quality.

Roads are also important to visitors who seek to get away from roads by using the Forest's 1,400-mile trail system. Forest roads provide access to over 150 major trailheads.

Roads also provide access for Forest visitors who seek solitude by accessing parts of the Forest where there are few other people. Some seek the pleasure of a weekend drive through a remote part of the Forest, or a truly dispersed campsite on a seldom-visited landing or spur road.

#### *Objectives:*

Retain access to developed recreation sites, major trailheads, and concentrated use areas.

Continue to provide road access opportunities for dispersed recreation uses in non-concentrated areas.

#### *Analytical Questions:*

1. Does the road provide primary or the only access to a developed recreation site or sites?

2. Does the road provide alternate or secondary access to a developed recreation site or sites?
3. Does the road provide primary or the only access to a major trailhead?
4. Does the road provide alternate or secondary access to a major trailhead?
5. Does the road provide access to a concentrated use area?
6. Has the public identified the road as providing valuable access for dispersed recreation, driving for pleasure, or other low-intensity recreational pursuits?

*Evaluation Criteria:* Yes or no to the above analytical questions.

#### **f. Vegetation Management – Commercial and Non-commercial**

*Identification:* At present, on the Forest, there are over 30,000 individual stands comprising approximately 900,000 acres (from GIS/gpveg) that could potentially have some sort of vegetation management activity. Vegetation management, for the purposes of this analysis, could be any form of management that pertains to the vegetation on a site, ranging from pulling or cutting unwanted vegetation by hand to regeneration timber harvest. The current road system, plus any additional roads that might be identified as needed in the future, provide access to these stands. The stands also are the locations for the collection of various special forest products. In fiscal year 2001 the Forest issued 15,000 commercial and personal use special forest product permits along with 30 special forest product contracts (ATSA/STARS). This does not include our seven current timber sales under contract, or future sales.

The majority of Special Forest Products permits that are issued utilize areas that have had vegetation management in the past or the permits are in the location of, or are part of, a current vegetation management activity. Therefore, in order to avoid a very similar analysis, the Vegetation Management issue will also be used to evaluate access needs for Special Forest Products.

Many of these 30,000 stands are either scheduled for, or based on their current condition are likely to receive, some kind of vegetation management treatment within the next twenty years as well as being used for collection of special forest products by the public. This was the time period used for determining access needs. Vegetation management treatments considered included timber harvesting, planting, release, precommercial thinning, pruning, fuels reduction, prescribed burning, and fertilization. These activities can produce timber commodities as well as special forest products for the public's use.

*Analytical Questions:*

1. Will the road be needed over the next 20 years for timber sales?  
(This would identify the need for a road that would be safe to access and transport timber with fairly large equipment. Access would be adequate for Special Forest products by retention of these roads. The road, however, could be limited in terms of access periods to reduce the maintenance costs.)

2. Will the road be needed over the next 20 years for treatments pertaining to managing reforestation efforts within plantations?  
(This would indicate a lower need for access with large equipment so a road would not necessarily need to be open and maintained. Some special forest products may require the use of large equipment for loading and removal but a closed road that could be re-opened or a road with a gated closure would be adequate for this purpose and still reduce costs of maintenance.
3. Will the road only be needed for the purpose of reviewing stand condition over the next twenty years?  
(This would indicate that the road could be decommissioned with walk-in access, or access limited by seasonal or year round closure. The access for this purpose typically could be on foot or ATV with a limited width such as four feet. This could also apply to some Special Forest Products Permits.

*Evaluation Criteria:* Yes or No to each of the analytical questions. Yes to question 1 yields a “high” need for vegetation management access; yes to question 2 yields a “moderate” need; and yes to question 3 yields a “low” access need for vegetation management. All “no’s” would also yield a “low” access need for vegetation management.

#### **g. Special Forest Products – Commercial and Personal Use**

*Identification:* In the past decade, demand for traditional and non-traditional products has increase substantially. There are four types of collection allowed on the forest:

1. Tribal Use: Traditional noncommercial gathering by Native Americans affiliated with a federally recognized tribe.
2. Incidental Use: On-site product consumption/use, usually associated with recreation activities.
3. Personal Use: Collection of materials for personal use/consumption, not for sale or resale after any intermediate processing.
4. Commercial Use: Collection of materials for the primary purpose of sale, resale, or use in manufacturing process resulting in a finished product that will be sold.

A permit is required to remove all forest products other than edible berries from the Gifford Pinchot National Forest. Nearly 10,000 permits and 30 contracts were issued in 2001 on the Gifford Pinchot National Forest, yielding approximately \$900,000 in revenues. In addition, nearly 5,000 free-use permits were issued with an estimated value of \$50,000.

Road access is a key factor in determining where forest products are harvested. If roads to popular areas or future contracts areas are closed, the special forest products program will decline.

*Objective:* Retain road access to areas that are presently or predicted to be important sources of special forest products.

*Analytical Questions:* The analysis of the vegetation management issue was considered to adequately identify roads needed for Special Forest Products.

#### **h. Cross-Forest Links (Potential Public Forest Roads and others)**

*Identification:* National Forest System Roads (NFSR) are important because they provide access into the Forest and through the Forest connecting to county or State routes. These routes strengthen links in the transportation system of roadways from the National Highway System to the local rural routes of States, counties, towns and Federal Agencies. Several federal programs exist that are intended to provide improved access and service to the public, enhance economic development for local communities, and correct chronic environmental problems caused by the transportation system. These programs are important to the Forest because they can provide additional funding sources not normally available to the Forest Service or shift jurisdiction of roads to the state or county.

Public Forest Service Roads (PFSR) - Public Forest Service Roads provide access to National Forest sites. Forest Development Roads (FDR) are designated “open to public travel” in accordance with USC’s 101(a). As a public road authority the Forest Service may propose a FDR for PFSR status if these roads are identified as serving a compelling public need. Potential funding sources include the Highway Trust Fund, the Department of the Interior and Related Agencies Appropriations or User Fees. The following criteria are considered for a potential Public Forest Service Road:

1. Objective Maintenance Level 3 – 5
2. Under Forest Service Jurisdiction
3. Provide unrestricted access (except for emergencies, seasonal snow closures or scheduled closures)
4. Serve a compelling public transportation need

For a road to be designated as a PFSR the Forest must coordinate with state and local road authorities before designation is formally requested.

The Forest currently has three roads submitted for consideration as PFSR (FDR 25, 52, and 90) with an additional seventy-three roads that meet basic criteria as potential PFSR. At this time the Forest is considering only two additional roads (FDR 23 and 99) for consideration as PFSR. Actual designation of PFSR will depend on the amount of future funding available for the national program.

Forest Highways. The Forest Highway Program establishes public access through the National Forest. Under this program jurisdiction of the road is transferred from the Forest Service to the State, county or local community. The road becomes a subset of the State, county or town road system and the Forest Service is no longer responsible for maintenance

or management of the road. Designation and project selection is done jointly with the Federal Highway Administration, Forest Service, and State Department of Transportation. There are presently 16 designated Forest Highway roads that connect directly to Forest Development Roads on the Gifford Pinchot National Forest. Some of these connecting forest service roads have potential as future Forest Highway designation because they represent important cross-forest links or access to private holdings.

Scenic Byways. The National Scenic Byways Program is a federally supported program to identify and develop special scenic byways that offer outstanding scenic, historic, natural, cultural, recreational, or archaeological values. The Forest Service can nominate roads for scenic byway status, but nominations must come through the State, with the States' concurrence. Designation can make a route eligible for federal scenic byway grants, technical assistance from the Federal Highway Administration and inclusion in national Scenic Byways Promotional plans. Although there are no Forest roads under consideration at this time, potential routes would be the Wind River Road, Curly Creek Road, FDR 90, FDR 25, and FDR 52.

Schedule A Development Agreements. Cooperative agreements between the Forest Service and local counties identify Forest Service roads that serve a compelling need for local residential access along these routes. Under these agreements the Forest Service develops the road to a standard that is acceptable to the county and then Forest Service jurisdiction and easements are transferred to the county.

*Objective:* Recognize which forest roads that are important as network links across the forest or have the potential for nomination into State, county or federal programs for road improvement, economic development or other corridor enhancements.

*Analytical Questions:*

1. Does the road link to a designated Forest Highway?
2. Is the road a through route (connecting to a road linked to a county or State road)?
3. Does the road have an Object Maintenance Level 3 -5?
4. Does the route possess significant byway criteria (i.e. scenic, historic, cultural, recreational, or archaeological)?

*Evaluation Criteria:* Yes or no to the above analytical questions.

**i. Economics – Identify a road system that is more affordable to maintain**

*Identification:* The current road management budget for the Forest is insufficient to maintain all of the currently open and maintained roads to the standards associated with their maintenance levels. The difference is on the order of one-half of the necessary funding. Additional funding sources may be found such as the county payments or timber sales (current sales of timber are far below the amount anticipated by the Northwest Forest Plan). Roads Analysis may identify opportunities to reduce the total amount of road maintenance

needed by closing or decommissioning roads. It is unlikely, however, that either of these two (increased funding sources, decreases in maintained roads) will bring the funding in balance with the needs. Funding sources doubling the current budget are an unrealistic expectation. Likewise, closing or decommissioning half of the roads on the Forest is unacceptable from the public standpoint and it would severely impact our ability to manage the resources of the Forest.

*Objective:* The economics issue will be used to compare the affordability of the current or recommended future road system based on the anticipated budgets and the estimated costs for road maintenance.

*Analytical Questions:*

1. What are the costs of maintaining the current road system and the road system recommended by Roads Analysis?
2. How do the costs of maintaining the current or recommended road system compare to the current and anticipated road management budget for the Forest?

*Evaluation Criteria:*

1. The total road maintenance costs for the total forest road system calculated using the current BFES road maintenance costs per mile per year. (For the current and recommended future road maintenance levels)
2. The current Forest road maintenance budget (and the future budget based on anticipated changes in funding levels) compared to the estimated costs for maintaining the road system expressed as a fraction or a percent. (For the current and recommended future road maintenance levels.)

## **2. Aquatic Risks**

### **a. Water Quality – Surface Erosion from Roads**

*Identification:* Erosion from roads can cause chronic sediment inputs to nearby streams. Eroded sediment from road surfaces and cut and fill slopes is transported to ditches, gullies below relief culverts, water bars, or directly to streams or the forest floor via overland flow. Poorly vegetated cut and fill slopes erode through run-off processes as well as through frost heaving. Surfacing materials reduce the erosion potential from the road surface.

Forest wide data on the area and condition of cut and fill slopes is not available. Therefore the potential erosion from only the road surface will be assessed. Sediment delivery to streams will be estimated as the road erosion transported to streams via ditch runoff within 200 feet of a stream and via ditch relief culverts and direct overland flow if roads are within distances ranging from 50 to 100 feet of streams depending on the type of road (local, collector, arterial).

*Objective:* The objective is to eliminate or treat roads with the highest propensity for generating surface erosion. The intent is to reduce sediment inputs to the aquatic system.

*Analytical Question:* What is the relative sediment generation and delivery potential of the road segment?

*Evaluation Criteria:*

Low risk = no delivery (no culverts/bridges crossing streams and road not near a stream)

Moderate risk = Less than 20 tons of sediment/year/mile delivered to streams

High risk = 20 tons or greater of sediment/year/mile delivered to streams

## **b. Water Quality/Channel Condition – Mass Wasting**

*Identification:* Roads located on unstable slopes have an increased potential for failure during periods of heavy runoff. These types of failures can deliver large amounts of sediment to streams as well as remove important structural and habitat elements from the channel. Although these events can be catastrophic when they occur, they are relatively infrequent due to the general stability of the landforms on the Forest.

*Objective:* The objective is to eliminate or stabilize roads located in unstable landscape positions. The intent is to reduce the water quality and channel impacts occurring as a result of road-related mass wasting.

*Analytical Questions:* Does the road lie on hill slopes that have been identified as unstable or potentially unstable?

*Evaluation Criteria:*

Low risk = road segment crosses no previous landslides or potentially unstable soils.

Moderate risk = road segment crosses potentially unstable soils.

High risk = road segment crosses known previous landslides, or is known to have had past failures.

## **c. Channel Processes/Habitat Condition - Roads in Riparian Reserves**

*Identification:* The existence of roads in Riparian Reserves can affect the function of the Reserves by reducing the amount of area providing shade to streams, reducing the area growing trees for future recruitment to streams, and increasing the potential for sediment introductions to the stream.

*Objective:* Reduce the area in Riparian Reserves that is occupied by roads, particularly in subwatersheds that have a high existing road density in riparian areas. The intent is to

increase development of riparian vegetation including large trees, increase stream shading, and to improve floodplain function and channel processes.

*Analytical Questions:*

1. Does the road lie in part within Riparian Reserves?
2. Does the subwatershed have a high degree of roads in Riparian Reserves?

*Evaluation Criteria:*

The following table summarizes the evaluation criteria for Riparian Reserves.

Road density in Riparian Reserves w/in 7 <sup>th</sup> field subwatershed				
Percent of road segment in Riparian Reserve		0-2.4 mi/sq. mi.	2.4-3.5 mi/sq. mi.	>3.5 mi/sq. mi.
	0%	Low	Low	Low
	0-25%	Low	Mod	High
	>25%	Mod	High	High

**d. Channel Process Impacts due to Stream Crossings**

*Identification:* Stream crossings are the locations on the road system with the greatest propensity for impacting aquatic resources—through surface erosion, potential failure during culvert malfunction, impeding downstream movement of woody debris and sediment, impeding upstream movement of fish and other aquatic organisms, and by providing the linkage between roadside ditches and natural stream channels. Because stream crossings are the locations where roads most directly interact with aquatic systems, these sites are seen as the number one road-related risk to aquatic resources.

*Objective:* Reduce the number of stream crossings, particularly in subwatersheds with a large number of existing crossings. The intent is to reduce sediment inputs, to increase channel connectivity for routing sediment, wood, fish, and other biota, and to reduce the hydrologic connection between roadside ditches and stream channels.

*Analytical Questions:*

1. Does the road have one or more stream crossings?
2. Does the road lie in a subwatershed with a high number of road crossings?

*Evaluation Criteria:*

The following table summarizes the evaluation criteria for stream crossings.

**Stream Crossing frequency in 7<sup>th</sup> field subwatershed**



Number of stream crossings on road segment		0 – 2.5 X'ings/mile	>2.5 X'ings/mile
	0 X'ings	Low	Low
	> 0 X'ings	Mod	High

#### e. Cumulative Modifications to Stream Flow

*Identification:* Roads can accelerate rates of water movement to stream channels, and - particularly when combined with harvest-related openings in the forest canopy - can alter hill slope hydrologic processes enough to affect stream flows. This is of greater concern in areas where higher levels of past clearcut harvest and road development were combined with riparian harvest and stream cleanouts. Streams draining these highly impacted portions of the watershed continue to experience effects from these past activities, including accelerated channel migration, channel widening and incision, and loss of habitat complexity. This issue focuses on those highly impacted parts of the watershed.

*Objective:* Reduce road mileage in subwatersheds where intensive past management activities have likely altered the magnitude, timing, or frequency of peak and low stream flows. The intent is to reduce cumulative effects of harvest and roading on runoff mechanisms.

*Analytical Questions:*

1. Does the road segment lie in a subwatershed that has had substantial harvest in the past?
2. Is the road segment located in a subwatershed that lies largely within rain-on-snow elevations?

*Evaluation Criteria:*

Low Risk = road segment is in subwatershed w/Aggregate Recovery Percentage (ARP) of >90.

Moderate Risk = road segment is in subwatershed w/ARP <90 and >80; **or** ARP <80 and ROS < 30.

High Risk = road segment is in subwatershed w/ARP <80 and ROS >30.

#### f. Fish Passage Barriers

*Identification:* All stream crossings should allow efficient fish passage under the road. Anadromous salmonids migrate upstream and downstream during their life cycles, usually over long distances. Many resident salmonids and other fish and aquatic organisms also move extensively upstream and downstream to seek food, shelter, better water quality, and spawning areas. Road crossings can be barriers to migration, usually because of outfall

barriers, excessive water velocity, insufficient water depth in culverts, disorienting turbulent flow patterns, lack of resting pools below culverts, or a combination of these conditions.

Typical stream crossings involve bridges or culverts. Bridges are preferred because they usually cause less modification of stream channels than do culverts, and are often the best way to assure fish passage. Culverts are the most common type of crossing device and the most likely to cause barriers to fish migration.

*Objective:* Eliminate, treat, and/or improve roads with culverts impeding fish passage on the Forest. The intent is to reduce impediments to fish migration.

*Analytical Questions:*

1. Does the road segment in watersheds where the fish passage/culvert inventory was conducted have a culvert impeding fish migration?
2. Does the road segment cross a fishbearing stream in the watersheds where the fish passage/culvert inventory has not been conducted?
3. Does the road segment with a culvert fish barrier keep fish from accessing a significant amount of upstream habitat?

*Evaluation Criteria:*

Low Risk = road segment does not have culvert impeding fish movement or does not cross a fish bearing stream

Moderate Risk = road segment crosses a fish bearing stream in watersheds that did not have culverts surveyed or less than a tenth of a mile of upstream habitat available above fish barrier.

High Risk = road segment has a surveyed culvert impeding fish movement.

### **3. Terrestrial Risks**

#### **a. Big Game Winter Range**

*Identification:* A goal in the Gifford Pinchot NF Plan is to limit open road densities in deer and elk winter range to 1.7 miles per square mile, and 0.63 miles per square mile in mountain goat winter range. Open roads can significantly reduce the habitat capability for deer, elk and mountain goats, particularly on the winter range. Road access and associated timing of human activities can displace and potentially affect the health and vigor of big game during the winter, and affect productivity during the reproductive season.

*Objective:* Maintain quality winter range habitat for big game by achieving Forest Plan goals for open road densities by watershed.

*Analytical Questions:*

1. Does the road occur within biological deer and elk, or mountain goat winter range?
2. If so, does the road occur within a watershed that exceeds the Forest Plan recommendations for open road density within big game winter range?

*Evaluation Criteria:*

Yes or No to the above analytical questions.

#### **b. Threatened, Endangered, and Sensitive Animal Sites, and Other Protected Sites**

*Identification:* Some rare or uncommon species may be adversely affected by human intrusion via roads, particularly during the breeding season. Guidelines have been developed for some of these species through the ESA consultation process (for Federally listed species) and in the Gifford Pinchot NF Plan.

*Objective:* Provide protection at breeding sites (or critical winter areas) of selected species by reducing vehicular access.

*Analytical Questions:*

1. Does the road segment occur within .25 miles of a known spotted owl, marbled murrelet, or northern bald eagle nest or winter roost site?
2. Does the road segment occur within 660 feet of a northern goshawk, osprey, or great gray owl nest or heron colony?
3. Does the road occur near the breeding sites of other listed species such as the gray wolf or wolverine?

*Evaluation Criteria:* Yes or No to the above analytical questions.

#### **c. Habitat Fragmentation by Roads: Special and Unique Habitats**

*Identification:* One effect of roads is the potential introduction and spread of exotic plant and animals by providing a disturbed substrate that these species utilize for dispersal. The spread of non-native species (particularly plants) can adversely affect unique, rare and uncommon plant communities, or special habitat features (talus, cliffs, caves, wetlands, etc.).

*Objective:* Improve or maintain the integrity of special and unique habitats by reducing road access to these sites where possible.

*Analytical Questions:*

1. Does the road occur within 100 meters of a unique or rare plant community?
2. Does the road occur within 100 meters of a special habitat feature?

*Evaluation Criteria:* Yes or No to the above analytical questions.

**d. Habitat Fragmentation by Roads: Interior Forest Patches**

*Identification:* Roads have the potential to adversely affect interior forest patches through direct habitat loss, edge effect, limiting the travel or dispersal of some organisms, direct mortality and other factors associated with both the road and vehicular traffic.

*Objective:* Improve or maintain the biological integrity of interior forest patches in Late-Successional Reserves and by reducing road access and/or densities to these areas where possible.

*Analytical Questions:*

1. Does the road occur within an interior forest patch greater than 360 acres in size in a Late-Successional Reserve?

*Evaluation Criteria:* Yes or No to the above analytical question

**e. Forest Plan Standards and Guidelines for Roads/Trail Crossings**

*Identification:* The Forest Land and Resource Management Plan established Trail Management Standards and Guidelines in order to protect the integrity of the Forest's trail system. All trails were assigned to one of three trail management levels. For Level I trails, no new road crossings are permitted, and existing local roads are to be closed. For Level II trails, no new road crossings are permitted within two miles of existing road crossings. In addition, no new road crossings are permitted within ½ mile of the boundary of designated Wilderness or semi-primitive recreation areas, or between the boundary of such areas and the nearest trailhead, whichever is closer. For both Level I and Level II trails, an unroaded corridor 500 feet on either side of the trail is to be maintained in areas between road crossings. On Level III trails, permanent road crossings should be minimized, and temporary roads should be obliterated after the activity is completed.

In 1994, the Forest completed a Roads-to-Trails Assessment as part of the Access and Travel Management process. Many of the identified projects have been accomplished, but some opportunities remain to enhance the trail system with additional road to trails conversions.

*Objectives:*

Protect and enhance the integrity of the Forest's trail system by insuring that Forest Plan Standards and Guidelines for trails are met.

Enhance the Forest's trail system by converting decommissioned roads into trails when such opportunities exist.

*Analytical Questions:*

For Level I trails:

1. Do any local (Level 1 or 2) roads cross the trail?
2. Do any roads approach within 500 feet of a trail in areas between road crossings?

For Level II trails:

1. Are any roads located within ½ mile of the boundary of designated Wilderness or semi-primitive recreation areas, or between the boundary of such areas and the nearest trailhead, whichever is closer?
2. Are there sections of trail with less than two miles between road crossings?
3. Do any roads approach within 500 feet of a trail in areas between road crossings?

For all trails:

1. Are there opportunities to reduce the number of road crossings?
2. Are there opportunities to convert decommissioned roads to trails?

*Evaluation Criteria:* Yes or no to the above analytical questions.

## **C. ANALYSIS PROCESS**

### **1. Process Steps**

#### **a. Identify most important issues and concerns**

The interdisciplinary team (ID Team) identified issues to be used during the analysis early in the process. Many of them were the same as those identified in the Wind River Watershed Analysis done on the Mt. Adams Ranger District in 2001. Some of those issues were edited or rewritten to better apply to the entire Forest. Other issues that were not part of the Wind River Analysis were added. Some of the issues were revised during the analysis as a result of further team discussions or as preliminary or potential analysis results were produced. The revisions were to improve the analysis results or to better define the issues.

#### **b. Identify access needs**

Access needs were determined based on several factors, including resource management, forest administration, recreation and forest protection. The methods used to determine the needs for individual roads varied according to the factor. Some required a more or less manual process of selecting roads from a map. Others used GIS data and queries to identify roads within certain distances or proximities to particular features, such as campgrounds, plantations, trails, etc.

Access needs were rated as high, moderate, or low based on criteria set by the ID Team. For each road the rating was that of the highest individual access need identified. Combinations of various access needs for a road did not produce higher ratings than a single need. Public input regarding access needs for specific roads was included with the team selections that were based on the other factors to produce the ratings. For a listing of the access needs and their respective ratings, see the Analysis Results section.

#### **c. Public Involvement**

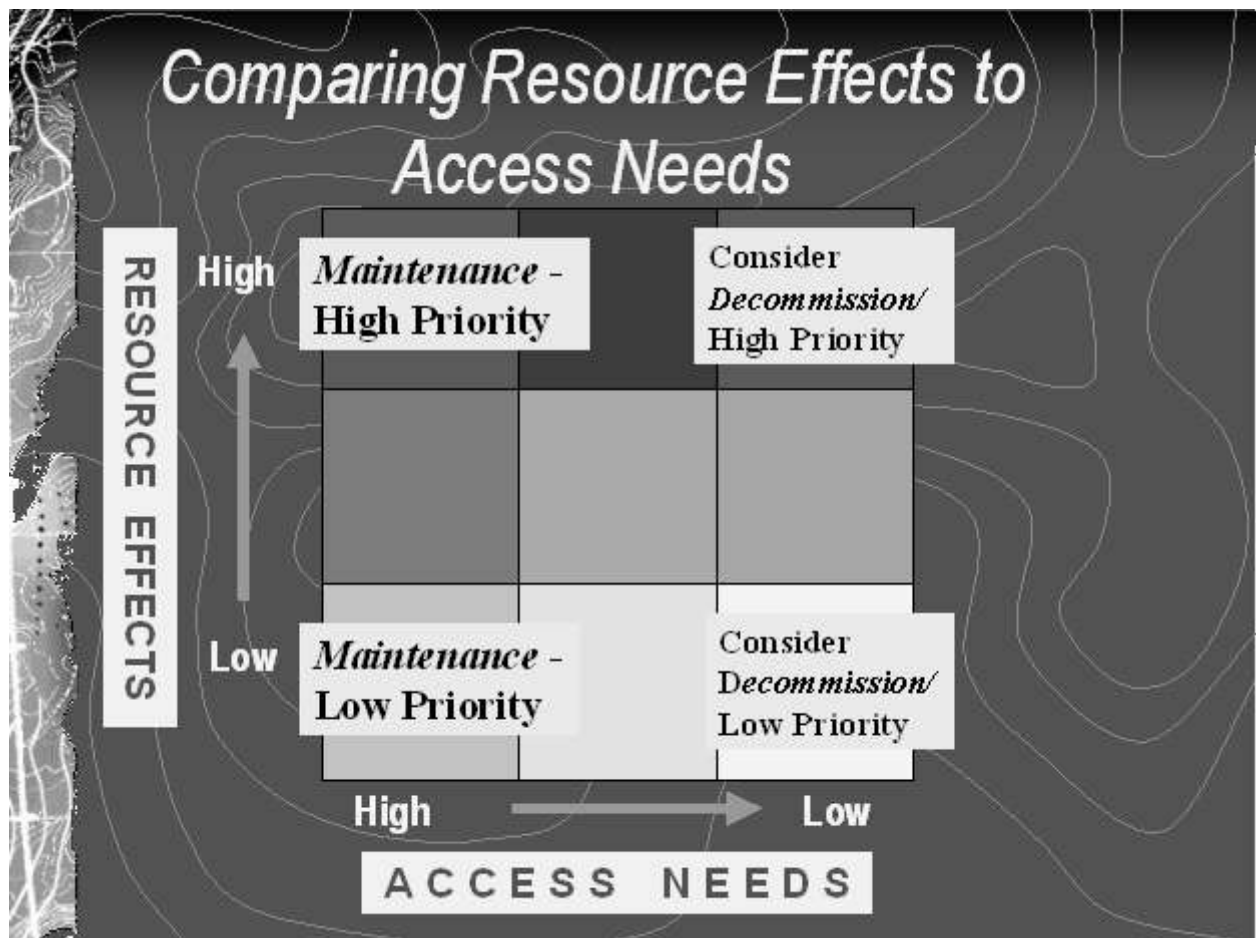
The beginning of the roads analysis process for the Gifford Pinchot National Forest was announced to the public, other agencies, adjacent landowners and the tribes in January 2002. Letters describing the process and timeline were sent to an extensive mailing list of Forest stakeholders. Additional announcements of upcoming public meetings were published in local newspapers and provided to other local media. In February, public meetings were held in Morton, Vancouver, and Stevenson, with a follow-up meeting in Stevenson at the request of a group of local interested individuals. Information regarding the analysis process, current road status and instructions for providing input to the process were provided at these public meetings. In addition, this information was posted on the forest Internet website. Over 200 comments were received either by mail, telephone or e-mail.

General comments from the public or other groups were used to verify and revise the issues used in the analysis. Comments relating to the desire to keep specific roads open were incorporated into a category of access needs. No specific “weighting” or other differentiating

process was given to roads that were commented on more than once, since the public input process was not a sampling and, thus, had no statistical validity on which to base such a weighting. Public comments regarding the desired closure or decommissioning of specific roads were not used in the analysis. ID Team recommendations for closure or decommissioning were based on the access need for the road combined with potential resource impacts identified during the analysis. Public comments of this sort (to close or decommission a road) would be better suited to individual project analysis where various alternatives could be analyzed site-specifically.

#### d. Evaluate existing roads against the issues

The basic method for evaluating roads was based on the comparison of the access need for a road to the resource impacts of the road. This methodology is illustrated in the following graph from the public meetings PowerPoint presentation:



For more information on how Access Needs and Resource Effects were rated, see the Issues and the Analysis Results sections of this document and the Access database reports and other information in the Appendices.

**e. Provide information and recommendations for future decisions regarding road management**

Roads Analysis results are stored in the format of Microsoft Access databases containing data for each of the road segments analyzed (approximately 4,000 segments representing about 4,000 miles of road). The results include separate database tables for each of the three analysis factors (Access Needs, Terrestrial Risks, and Aquatic Risks), summary tables of the resulting ratings for each of these factors, and tables of recommendations for future road management.

The Access databases can be used to produce maps in Arcview or Arcinfo by a fairly simple process of exporting a database table into an existing Arc project file and joining the table to a road map layer. The road map layer can be created from the routes of the standard Forest GIS roads layer using the starting and ending mile points of each road segment used in the analysis. Any of the attributes from the analysis can then be displayed, such as roads with high access needs, high aquatic effects, road closure recommendations, etc. By combining the map layer with District, watershed, or project area boundaries the maps and data can be viewed or summarized for other area or project analyses. This will be useful for site-specific analysis relating to future road management decisions.

The Access databases can also be sorted or summarized in any number of ways to produce reports or listings of desired attributes. For example, a listing of roads recommended for decommissioning or roads with high aquatic ratings, or roads with fish passage problems can easily be produced. Other types of summaries like total of road miles, numbers of road segments, or roads by District can also be generated for any chosen attribute.



## **D. ANALYSIS RESULTS SUMMARIES**

This chapter contains general summaries of the results of the Forest-wide Roads Analysis. For more detailed information, see the tables and maps in the Appendices or refer to the Roads Analysis Access Databases. A long-term location for the Access Databases on the forest computer system has not been developed at this time. Currently they reside in /fsfiles/projects/roads\_analysis under various file headings according to the particular issue or resource area. Summary databases of the issues and the recommendations are found in the /Analysis\_summaries file.

### **1. Access Needs**

The categories or access needs were defined as follows:

Vegetation Management/Special Forest Products  
Fire Suppression and Detection  
Public Forest Service Roads  
Private/Easements/Rights-of-Ways  
Mining/Quarries/Special Use Permits  
Developed Recreation  
Dispersed Recreation  
Administrative  
Public Input

High access needs ratings were assigned to roads in the “high” category of vegetation management/ special forest products (see issue statement), fire suppression and detection, public Forest Service roads, private/easements/rights-of-way, developed recreation and administrative access.

Moderate access needs ratings were assigned to roads in the “moderate” category of vegetation management/special forest products, mining/quarries/special use permits, dispersed recreation, and public input.

Low access needs ratings were assigned to roads the “low” category of vegetation management/ special forest products, and to all roads not identified as needed for any of the other categories.

The following table shows the miles of roads that fell within each of the access needs categories:

<b>Access Need</b>	<b>Miles</b>
Veg Mgmt/Sp For Prod = "high"	1,415
Veg Mgmt/Sp For Prod = "mod"	799
Veg Mgmt/Sp For Prod = "low"	2,198
Fire	2,812
Public FS roads	307
Pvt/Easement/ROW	626
Mining/Quar/Sp Use Perm	1,330
Developed Recr	700
Dispersed Recr	449
Administrative	131
Public Input roads	489

Note: Total miles are more than Forest total because roads may fall into more than one category.

The following table is a summary of the Access Needs ratings:

<b>Access Needs Rating</b>	<b>Miles</b>
High	3,262
Moderate	340
*Low	711

\* Includes roads that are currently decommissioned or converted to a trail.

## 2. Aquatic Risks

The aquatic risk categories were identified as:

Surface Erosion  
 Mass Wasting  
 Roads in Riparian Reserves  
 Stream Crossings  
 Stream Flow  
 Fish Passage

See the individual Issue statements for how each of these was rated high, moderate or low. The following table shows the miles of roads for each rating in each category:

<b>Aquatic Risk</b>	<b>High (mi.)</b>	<b>Mod (mi.)</b>	<b>Low (mi.)</b>
Surface Erosion	1,248	1,992	1,118
Mass Wasting	1,273	641	2,444
Roads/Riparian Reserves	3,361	143	853
Stream Crossings	2,302	872	1,184
Stream Flow	2,301	1,424	632
Fish Passage	418	866	3,072

The overall aquatic risk rating of high, moderate or low for a road analysis segment was determined by the composite score of the individual ratings above with high = 3, moderate = 2, and low =1 being assigned to each risk category. A composite score of 14-18 was assigned a high overall risk rating, a score of 10-13 was assigned a moderate risk, and a score of 6-9 was assigned a low risk. The following table shows the total miles of road in each overall aquatic risk rating.

<b>Aquatic Risk</b>	<b>Miles</b>
High	1,848
Moderate	1,601
Low	963

### 3. Terrestrial Risks

The Terrestrial Risk categories were identified as:

Special or Unique Habitats (wetlands, talus, caves, etc.)  
 Fragmentation of Interior Forest Habitat  
 Threatened, Endangered, and Sensitive Species and Other Protected Species  
 Big Game Winter Range  
 Forest Plan Standards and Guidelines for Roads/Trail Crossings

If identified as “yes” for any of the following, the overall terrestrial rating for a road segment would be “high:”

*Deer and Elk Winter Range, within a watershed with >1.7 mi/sq. mi. open road density*  
*Goat Winter Range, within a watershed with >0.63 mi/sq. mi. open road density*  
*TES species within 1/4 mile or other protected spp. within distance specified in GPLRMP*  
*Does not meet GPLRMP S&G's for roads/trail crossings*

The following terrestrial issues, if identified as “yes,” would result in a “moderate” overall road segment rating:

*Deer and Elk Winter Range (not in watershed with >1.7 mi./sq. mi. open road density)*

*Goat Winter Range (not in watershed with >0.63 mi/sq. mi. open road density)*

*Interior Habitat Fragmentation*

*Special and Unique Habitats within 100 meters*

If all terrestrial issues were a “no,” a road segment would have an overall rating of “low.”

The following table shows the miles of roads for each rating in each category:

<b>Terrestrial Risk</b>	<b>High (mi.)</b>	<b>Mod (mi.)</b>	<b>Low (mi.)</b>
Special or Unique Habitats	0	2,520	1,939
Frag. of Interior Forest Habitat	0	1,146	3,313
TES Species/Other Protected Spp.	750	0	3,709
Big Game Winter Range	939	755	2,765
Roads/Trail Crossings S&G's	477	0	3,982

The overall terrestrial rating for a road analysis segment was defined as the highest of the ratings for each of the five terrestrial risk categories for that road. The following table shows the total miles of road in each overall terrestrial risk rating.

<b>Terrestrial Risk</b>	<b>Miles</b>
High	1,724
Moderate	1,546
Low	1,142

## **E. ROAD MANAGEMENT RECOMMENDATIONS**

### **1. Road Management**

The recommendations from the Forest-wide Roads Analysis are updates to the 1994 Access and Travel Management Plan (ATM Plan), as modified by subsequent road management decisions. Specifically, the “Desired Future Condition” identified for each road segment in the ATM plan is replaced with the recommendation from this Roads Analysis, along with the Maintenance Level that is proposed. In addition, a Priority is added, based on the degree of aquatic risk identified. This priority is intended to help identify those road segments that appear to need treatment first, whether the treatment is closure, decommissioning, or simply road maintenance. This would be useful when planning road management with limited funding. What funds are available could then be targeted to the higher priority roads. Terrestrial risk was not seen as needed to establish priority, at least in comparison to aquatic risk. Unlike aquatic risks, terrestrial risks would not be expected to result in potentially deteriorating resource conditions, or even catastrophic loss, if left untreated.

The road management codes used in the ATM Plan were slightly modified based on this Roads Analysis. Two problems identified by the ID Team in the ATM codes were those for “Closing Naturally” (code CN) and “Closed with a Device” (code CD). Roads identified as closing naturally were those that may or may not be currently open, but were not being maintained due to limited budgets or other reasons. This served the purpose of describing the current condition of the road but is inappropriate for a “desired future condition.” Therefore, all of the roads with this road management in the ATM Plan were recommended to be open, closed or decommissioned based on the findings of Roads Analysis. The code CN was eliminated as one of the possible recommendations.

Roads coded in the ATM Plan as closed with a device included both administrative closures (road closed to the public –usually with a gate- but open for administrative traffic) and those closed and blocked to eliminate all vehicle traffic. This made it difficult to determine whether the road needed to be maintained, or was stabilized in a self-maintaining condition to reduce or eliminate resource impacts. This distinction is important, particularly for determining whether the road meets the intent of the Memorandum of Understanding with the State Department of Ecology regarding the Clean Water Act. Two new road management strategies, closed to public, administrative traffic only (code CA) and closed and stabilized (code CS) were added to better describe these two situations.

The road management recommendations, therefore, fall into one of the following seven categories:

- OP – Open to passenger cars
- OH – Open to high-clearance vehicles
- SO – Seasonally open
- CA – Closed to public, administrative traffic only
- CS – Closed and stabilized
- DE – Decommission

## RT – Road to trails conversion

The following table shows the miles of road recommended for each of the road management categories. For recommendations on specific road segments including the recommended priority for road management, see the tables and maps in the Appendix D.

<b>Recommended Road Management</b>	<b>Miles</b>
OP – Open to passenger cars	636
OH – Open, high-clearance vehicles	941
SO – Seasonally open	1,226
CA – Closed to public, admin. only	194
CS – Closed and stabilized	673
DE – Decommission	697
RT – Road to trails conversion	47

## 2. Road Maintenance

The following table shows the miles of road recommended for each of the road management categories. For recommendations on specific road segments including the recommended priority for road maintenance, see the tables and maps in Appendix D.

<b>Recommended Maintenance Level</b>	<b>Miles</b>
Level 1	673
Level 2	2,178
Level 3	517
Level 4	188
Level 5	113

## 3. Economics

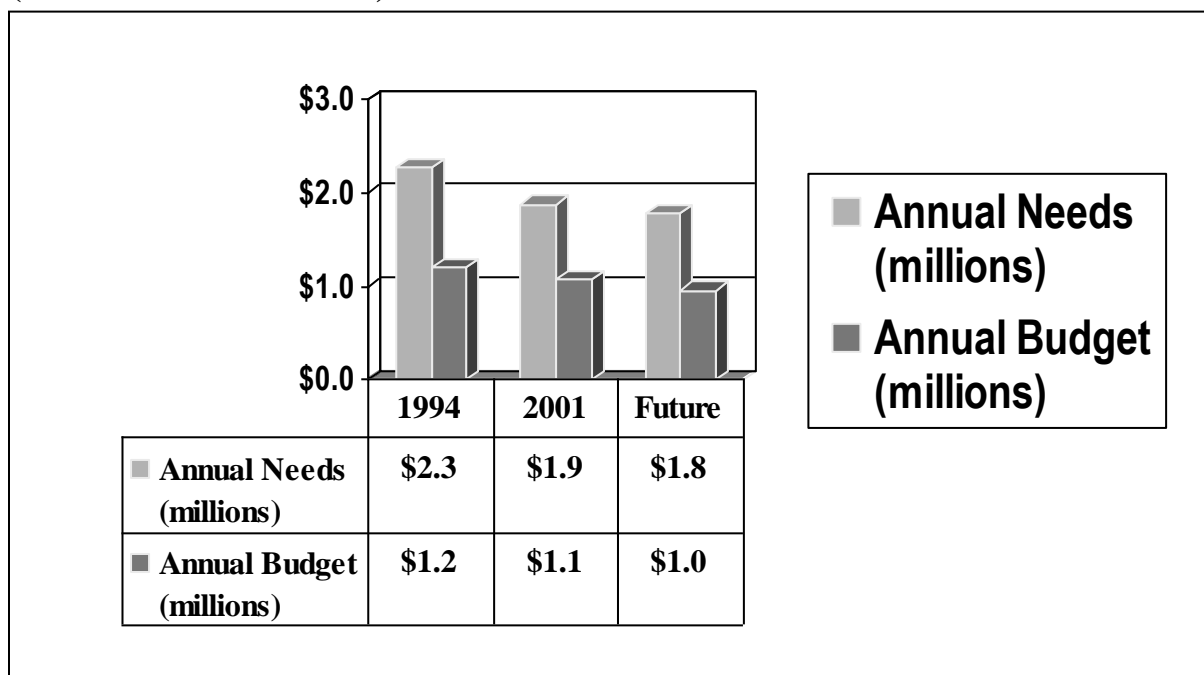
The economics of the current road system compared to the road system that would result from implementing all of the road management recommendations were based on the estimated costs of maintaining the entire forest road system. The estimated annual needs for forest road maintenance were calculated using the total miles of road in each maintenance level times the following BFES road maintenance costs: (expressed in dollars per mile per year)

Maintenance Level 1 – \$86  
 Maintenance Level 2 – \$171  
 Maintenance Level 3 – \$987  
 Maintenance Level 4 – \$2,632  
 Maintenance Level 5 – \$3,290

The current Forest road maintenance budget (and the future budget based on anticipated changes in funding levels) was then compared to the total estimated costs for maintaining the road system.

The results are illustrated in the following graph from the public meetings PowerPoint presentation:

### Road Maintenance Needs vs. Budget (Constant 2001 Dollars)



The Forest Leadership Team will develop a strategy during the coming year to address the gap between the annual maintenance needs and the annual road maintenance budget. Possible solutions to closing the gap include alternative funding sources such as county payments and additional project funded maintenance that has been at historically low levels, primarily due to the lack of timber sales being sold or operated.